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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,991

10/30/2006

Masayuki Hoshino

L9289.06181

4269

52989

7590

02/08/2008

STEVENS, DAVIS, MILLER & MOSHER, LLP

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WASHINGTON, DC 20036

EXAMINER

NGUYEN, TUAN HOANG

ART UNIT

PAPER NUMBER

2618

MAIL DATE

DELIVERY MODE

02/08/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/588,991

Applicant(s)

HOSHINO ET AL.

Examiner

Tuan H. Nguyen

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 08/10/2006 and 07/10/2007 has been considered by Examiner and made of record in the application file. However, 5 documents (see marked up on the copy of IDS) had not submitted to the office, for further consideration, please submit the missing documents.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US PAT. 7,171,240 hereinafter, "Kim") in view of Medvedev et al. (U.S PUB. 2003/0161282 hereinafter, "Medvedev").

Consider claim 1, Kim teaches a communication apparatus used in a communication system using MIMO, comprising: a reception section that receives information indicating the number of effective eigenvalues, said number of effective

eigenvalues being the number of eigenvalues greater than a predetermined threshold at a communicating party (fig. 5 col. 8 lines 40-59).

Kim does not explicitly show that Number of multiplex sequences control section that determines the number of multiplex sequences based on the number of effective eigenvalues, and arranges transmission data in the number of multiplex sequences; and a transmission section that transmits the transmission data of each sequence via different transmission streams by space-time coding.

In the same field of endeavor, Medvedev teaches Number of multiplex sequences control section that determines the number of multiplex sequences based on the number of effective eigenvalues, and arranges transmission data in the number of multiplex sequences (page 11 [0131-0132]); and a transmission section that transmits the transmission data of each sequence via different transmission streams by space-time coding (page 3 [0032-0033]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, Number of multiplex sequences control section that determines the number of multiplex sequences based on the number of effective eigenvalues, and arranges transmission data in the number of multiplex sequences; and a transmission section that transmits the transmission data of each sequence via different transmission streams by space-time coding, as taught by Medvedev, in order to transmit data over the available transmission channels in multi-channel communication systems such that higher overall system spectral efficiency and/or other

benefits may be achieved.

Consider claim 2, Medvedev further teaches the number of multiplex sequences control section increases the number of multiplex sequences of the transmission data as the number of the effective eigenvalues increase (page 11 [0131-0132]).

Consider claim 3, Medvedev further teaches the transmission section controls a space-time coding method based on the number of effective eigenvalues (page 3 [0032-0033]).

Consider claim 4, Kim teaches a communication method performing a communication using MIMO between two communication apparatuses, the method comprising the steps of: in the second communication apparatus, calculating an eigenvalue by performing eigenvalue calculation using a received signal, calculating the number of effective eigenvalues, said number of effective eigenvalues being the number of eigenvalues greater than a predetermined threshold (fig. 5 col. 8 lines 40-59), and transmitting information containing the number of effective eigenvalues to the first communication apparatus (col. 6 lines 49-61).

Kim does not explicitly show that in a first communication apparatus, forming a predetermined directivity by array antennas, and transmitting a signal from each antenna to a second communication apparatus; in the first communication apparatus, controlling the number of multiplex sequences of the transmission data based on the

number of effective eigenvalues, and transmitting the transmission data of each sequence via different transmission streams by space-time coding to the second communication apparatus.

In the same field of endeavor, Medvedev teaches in a first communication apparatus, forming a predetermined directivity by array antennas, and transmitting a signal from each antenna to a second communication apparatus (page 6 [0076]); in the first communication apparatus, controlling the number of multiplex sequences of the transmission data based on the number of effective eigenvalues (page 11 [0131-0132]), and transmitting the transmission data of each sequence via different transmission streams by space-time coding to the second communication apparatus (page 3 [0032-0033]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, in a first communication apparatus, forming a predetermined directivity by array antennas, and transmitting a signal from each antenna to a second communication apparatus; in the first communication apparatus, controlling the number of multiplex sequences of the transmission data based on the number of effective eigenvalues, and transmitting the transmission data of each sequence via different transmission streams by space-time coding to the second communication apparatus, as taught by Medvedev, in order to transmit data over the available transmission channels in multi-channel communication systems such that higher overall system spectral efficiency and/or other benefits may be achieved.

***Conclusion***

4. Any response to this action should be mailed to:

Mail Stop\_\_\_\_\_ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Facsimile responses should be faxed to:

(571) 273-8300

Hand-delivered responses should be brought to:

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401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Nguyen  
Examiner  
Art Unit 2618  
T.N.

  
**NAY MAUNG**  
**SUPERVISORY PATENT EXAMINER**